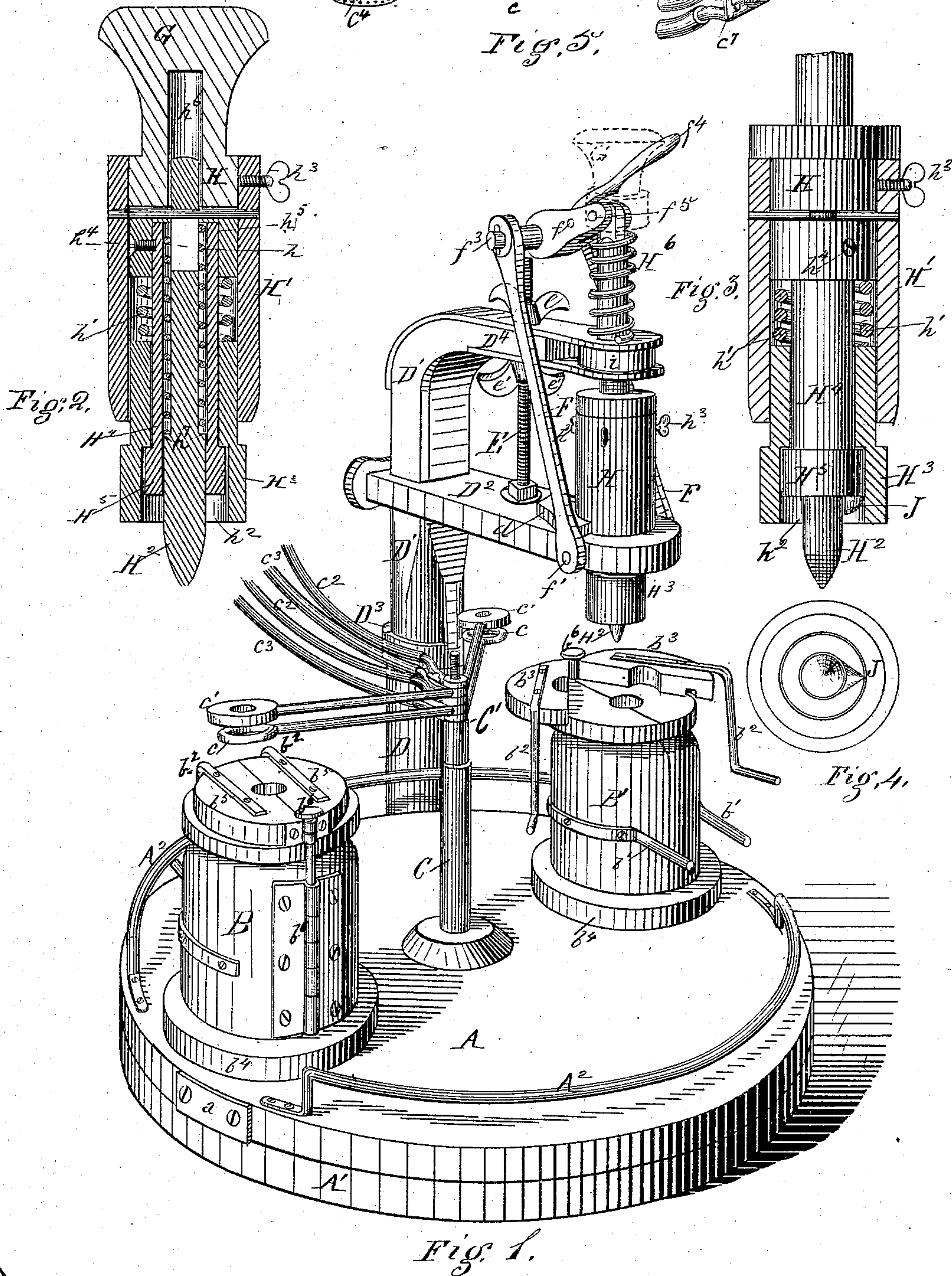


No. 238,090.

Patented Feb. 22, 1881.



Witnesses
 E. W. Grisabaugh
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UNITED STATES PATENT OFFICE.

WILLIAM C. COOK, OF PITTSBURG, PENNSYLVANIA, ASSIGNOR OF THREE-EIGHTHS TO WILLIAM H. BARR, OF SAME PLACE.

MACHINE FOR AND PROCESS OF FORMING RINGS OR RIMS ON GLASS BOTTLES.

SPECIFICATION forming part of Letters Patent No. 238,090, dated February 22, 1881.

Application filed October 6, 1879.

To all whom it may concern:

Be it known that I, WILLIAM C. COOK, of Pittsburg, Pennsylvania, have invented a new and useful Improvement in Machines and Processes for Forming Rings or Rims on Glass Bottles; which improvement is fully set forth in the following specification, reference being had to the accompanying drawings.

Similar letters of reference indicate corresponding parts.

My invention relates to the formation of rims or rings on the mouths of bottles and similar glass vessels; and it consists, first, in reheating the blow-over without removing the article from the mold, and then, when it is in a plastic condition, molding it into a rim or ring around the bottle-mouth; and, second, in the apparatus by means of which I carry said operation into effect.

To enable others skilled in the art to make and use my invention, I will now describe it by reference to the accompanying drawings, in which—

Figure 1 is a perspective view of the apparatus. Figs. 2 and 3 are sectional views of the plunger. Fig. 4 is an end view of the plunger of Fig. 3, and Fig. 5 is a perspective view of the pipes which supply the air and gas for reheating the blow-over.

A is a revolving table, placed and capable of revolution upon a suitable bed, A', and provided with handles A², for turning it thereon.

On the table A are two two-part molds, B and B', the said parts being hinged as at b⁶. Each mold has a bottom plate, b⁴, having a disk on its upper surface with flaring edges, around which the two parts of the molds close in the usual way, being provided with handles b' for opening and closing them. The mold B has a two-part ring or lip section, b⁵, on top of it, hinged to the pin b⁶, and provided with handles b² for opening and closing the parts. The mold B' is similarly provided with a two-part ring or lip section, b³, hinged at b⁶, and having handles b².

In the center of the revolving table A is a post or upright, C, which has a central extension-stem, C', by means of which the height of the post can be varied to correspond with the height of the molds used.

Pivoted to the top of the post C are four tubes, c c' c'. The tubes c are designed to supply gas for the reheating of the blow-over, and the tubes c' the air or oxygen that may be necessary to the proper combustion of the gas. For this purpose the outer ends of tubes c are provided with tubular rings c⁴, larger than the mouth of the mold, which are perforated on the under side to cause jets of gas to encircle and impinge upon the blow-over which projects from the mouth of the mold. The outer ends of the tubes c' are provided with flat or disk rings c⁵, having a double row of perforations, one inside and the other outside of the ring c⁴, so that the air or oxygen from the tube c' shall be projected on both sides of the stream of gas from the tube c, enveloping and commingling with it and insuring its perfect combustion. The tubes c and c' are preferably united and held in their proper relative positions by a central bar, c⁶. The gas is supplied to the tubes c through the pipes c³, and the air to the tubes c' through the pipes c², said gas and air being under pressure and controlled by valves at c¹, or at other convenient point.

D is a fixed post or upright, having a socket, D³, in its upper end, in which is placed the upright or post D' of a swinging frame for sustaining the pressing-tools that form the lip of the bottle.

Extending laterally from the post D' are two horizontal arms or gibs, D² and D⁴, the lower of which, D², slides vertically on the post D', being sustained and adjustable to suit the height of the mold used, by a long screw, E, which is provided with suitable nuts e e', one above and the other below the upper gib, D⁴.

Pivoted to each side of the gib D², at f', near the outer end, is an arm, F, which arms extend diagonally upward and backward, and above the gib D⁴ are pivoted to the opposite ends of a short shaft, f³. On the shaft f³ is a lever, f, to the outer end of which is pivoted the upper end of the plunger-shaft, as at f⁵. The lever f has a handle, f⁴, for operating the plunger.

The tool H is composed of several parts. Attached to the stock H by a screw, h³, is an outer cylinder, H'. The lower end of the stock H is bored out at h⁵ for the reception of an

inner cylinder, H^4 , which is secured to it by a screw, h^4 . Inside of the bore h^5 the stock has a deeper and narrower bore, h^6 , for the reception of the upper end of the plunger H^2 , which is secured therein by the rod h^7 , extending across the head and through a slot, h^8 , in the plunger. The slot h^8 is made long to permit of a certain vertical movement of the plunger in and independent of the movement of the stock H . The plunger H^2 is turned down to a smaller diameter at the middle section, to afford room for a spring, h , which, being placed on it, bears against the stock H at one end, and against a shoulder, h^7 , on the plunger at the other, and tends to hold the plunger out to its fullest extent, as shown clearly in Fig. 2. Placed between the cylinders H' and H^4 is an intermediate cylinder, H^3 , held in place by and having an enlarged diameter at its lower end to receive the collar H^5 on the lower end of the cylinder H^4 . The cylinder H^3 extends below the collar H^5 and forms an annular recess, h^2 , around the lower end of the plunger H^2 . Around the cylinder H^4 , between the lower end of the stock H and the upper end of the cylinder H^3 is a spiral spring, h' , which holds the cylinder H^3 down upon the shoulder H^5 , but permits it to have a limited vertical movement in the cylinder H' .

The operation of the above-described apparatus is as follows: During the operation of blowing the bottle the mold is closed, as at B. Projecting from the hole b^7 , at the close of the blowing operation, will be the "blow-over," which is a ragged broken tube of glass attached to the unfinished neck of the bottle. Heretofore the usual custom was to remove the bottle from the mold, reheat it in the "glory-hole" of the furnace, and finish it with a hand-tool. I throw open the top section, b^3 , (see mold B',) and bring the ends c^4 and c^5 of the air and gas tubes over the mouth of the mold and reheat the blow-over without removing the bottle from the mold. When the glass is sufficiently plastic I turn the air and gas tubes aside and bring down the tool. The tapered plunger H^2 enters and forms the interior of the mouth, and spreads the glass out into the annular recess, h^2 , so as to be pressed into a proper bead, rim, ring, or lip around the mouth. If there is too much glass in the blow-over, the springs h h' will permit the plunger H^2 and cylinder H^3 to give back sufficiently to accommodate it. The spring H^6 then retracts the tool, and the mold is opened and the bottle removed.

For vials and light ware a head or knob, G , (shown in broken lines in Fig. 1,) may be used for pressing instead of the lever f and its connections.

If it is desired to make a pouring-spout on the bottle a former, J , may be used, Figs. 3 and 4.

The stop a is designed to stop the rotation of the table A at the right place to bring the molds under the plunger.

The table A may be stationary, and the tool H made to swing over both molds, if desired.

The duplication of the mold is merely to increase the rapidity of the operation, as the bottle may be blown in one while that in the other is being finished. A pulley, i , is provided to rotate the plunger, if desired, in the production of threads on or in the bottle-mouth. In that case there would have to be a suitable coupling-connection between the lever f and rotating plunger, to permit the rotation of the plunger. Such a connection is a well-known mechanical contrivance.

The part d is a guide sliding back and forth on the gib D^2 , and designed to adjust the tool accurately to the molds.

This invention is applicable to the finishing of the ends of jars and many other articles which are blown in molds. It will, of course, be necessary to change the forming-face of the plunger to the particular size and shape of the article to be operated upon.

The advantages of my invention consist, mainly, in saving the heretofore necessary step of removing the article from the mold, reheating, and finishing by hand, and, in most cases, of gathering fresh glass to form the ring. Instead of this I complete the article without removing it from the mold, and, as it is finished by a machine, I save time in the operation, and obtain an increased production.

Heretofore the uniformity of the product depended upon the skill of the workman. I can adjust my machine so as to obtain a much more uniform result than is possible by hand.

Heretofore the article was liable to become distorted by being removed and finished away from the mold. This cannot happen in the use of my invention, because the article is supported during the entire finishing operation by the mold.

Where a gas which requires little or no oxygen to be supplied for its combustion is used the air-pipes c' may be dispensed with.

More than two molds may be arranged on the table A , if desired.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. The process of forming rings or rims on the mouths of glass bottles and similar articles, consisting in reheating the unfinished mouths of the same and subjecting them to forming-pressure while still in the mold in which they were blown, substantially as and for the purposes described.

2. The combination of the revolving table, two or more molds arranged on said table, jet tubes capable of being brought into position over the mouth of the said molds, and a pressing mechanism for forming the mouth of the articles contained in the molds, substantially as and for the purposes described.

3. The combination of a glass-mold and a jet tube or tubes for heating the end of an article in or projecting from the mouth of the mold, substantially as and for the purposes described.

4. The combination of a glass-mold and a swinging jet tube or tubes, for heating the end

of an article in or projecting from the mouth of the mold, substantially as and for the purposes described.

5 5. A standard for sustaining a glass-plunger or other forming-tool, provided with a vertically-adjustable gib upon which said tool is sustained, substantially as and for the purposes described.

10 6. A standard for sustaining a glass-plunger or other forming-tool, provided with a vertically-adjustable gib upon which said tool is sustained, in combination with a glass-mold, substantially as and for the purposes described.

15 7. A standard for sustaining a glass-plunger or other forming-tool, provided with a swinging gib upon which said tool is sustained, substantially as and for the purposes described.

8. The combination, in a tool for forming the lips of bottles and similar vessels, of a central

tapered plunger, a collar around said plunger 20 for forming the upper edge, and an outer cylinder for forming the outer surface of the lip, substantially as and for the purposes described.

9. The combination, in a tool for forming the lips of bottles and similar vessels, of a tapered 25 central plunger supported by a spring, a collar around said plunger for forming the upper edge of the lip, and an outer cylinder supported by a spring for forming the outer surface of the lip, substantially as and for the purposes de- 30 scribed.

In testimony that I claim the foregoing as my invention I have to the same set my hand in the presence of two witnesses.

WILLIAM C. COOK.

Witnesses:

GEORGE W. COOK,
JOHN BRADLEY.